Date: 14/8/

Ex No: 6
Sliding window Protocol

Aim:
Write a program to implement flow-control at data link layer using sliding window protocol. Simulate the flow of frames

Create a sender program with following features:

1. Input window size from the user
2. Input a text message from the user
3. Consider 1 character per frame.
4. Create a frame with following fields
5. Send the frames
6. Wait for the acknowledgement from the receiver.
7. Reads a file called receiver_buffer
8. Check ACK field for the acknowledgment number.

9) If the Acknowledgement number is as expected, send new set of frames accordingly.

Create a receiver file with following features

1) Reader a file called Sender_buffer

2) Check the frame no.

3) If the frame no. are as expected, write the appropriate ACK no. in the Receiver_buffer file.

Student Observation:

Code:

```
import random
import time

Total_frames = 10
window_size = 4
Loss_probability = 0.2
ACK_LOSS_probability = 0.1

def send_frame(frame_number):
    if random.random() < LOSS_
                    probability:
        print(f"[X] frame {frame_number}
            lost in transmission!")
        return false
    print(f"[>] frame {frame_number}
        sent successfully.")
    return true
```

```
def receive_frame(frame_number
    print(f"[√] receiver got
    frame {frame_number}.
Sending ACK {frame_number}
if if random.random() < ACK_LOS
    Probability:
    print(f"[X] ACK {frame_number}
return false
print(f"[<] ACK {frame_number}
return true


def Sliding_window_protocol():
    Sender_base = 0
    next_frame_to_send=0
    print(" Sliding window protocol
While Sender_base < Total_frame:
    While next_frame_to_send <
    Sender_base + window_siz
    next_frame_to_send += 1
ack_received = false
for frame in range(Sender_base
next_frame_to_send):
    if send_frame(frame):
        if receive_frame(frame):
            sender_base = frame+1
            ack_received = true
        for:
        else:
            print(f"[!] Sender time
            next_frame_to_send = Sender
            break
    else:
        print(f"[:]. Sender will
        retransmit from {sender_bas
        break
```

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output:

Sliding window protocol

[>] Frame 0 sent successfully
[>] Frame 1 sent successfully
[>] Frame 2 sent successfully
[>] frame 3 sent successfully
[√] Receiver got frame 0. Sending ACK 0
[<] ACK 0 received by sender.
[>] Frame 1 sent successfully
[√] Receiver got frame 1. Sending ACK 1
[<] ACK 1 received by sender
[X] Frame 2 lost in transmission !
[!] sender will retransmit from 2
[>] Frame 2 sent successfully
[√] Receiver got frame 2

Result:

The program to implement sliding window protocol is implemented successfully